

Minimizing ammonia loss from urea through mixing with zeolite and acid sulphate soil.

ABSTRACT

Ammonia volatilization is a major cause of nitrogen loss from surface applied urea. While all top dressed ammonia and ammonium-based fertilizers can be volatilized, the potential is greatest with urea and fluid containing urea. This laboratory study compared the effect of four different urea-zeolite-acid sulphate soil mixtures on NH_3 volatilization and, soil exchangeable NH_4 and available NO_3 contents of an acid soil with surface-applied urea without additives. The soil used in the study was a sandy loam Typic Paleudults (Nyalau Series). The mixtures significantly minimized NH_3 loss by 6 to 15% compared to urea alone. These treatments also significantly increased soil exchangeable NH_4 and available NO_3 contents compared to urea without additives. The increase in the formation of NH_4^+ over NH_3 and the temporary decrease in soil pH retarded urea hydrolysis at the microsite immediately around the fertilizer. Surface applied urea fertilizer efficiency could be increased by mixing it with zeolite and acid sulphate soil.

Keyword: Urea; Zeolites; Ammonia loss; Acid sulphate soil.